J. HYDROLOGY AND WATER QUALITY

This section describes the existing hydrological setting for the North Park Street Code area, including run-off, drainage, and water quality, based on information available from resource agencies and other recent CEQA documentation completed for Alameda projects. This section also identifies impacts that may result from the proposed North Park Street Code, and suggests mitigation measures to reduce potential impacts. Discussion of contamination of subsurface soils and groundwater resulting from past activities at the site is presented in **Section IV.F, Hazardous Materials**, of this chapter.

1. SETTING

a. Climate

The climate of the Oakland-Alameda area is characterized as dry summer subtropical (often referred to as Mediterranean), with cool wet winters and relatively warmer dry summers. The mean annual rainfall in the vicinity of the North Park Street Code area is approximately 23 inches.[1] Analysis of long term precipitation records indicates that wetter and drier cycles, lasting several years, are common in the region. Severe, damaging rainstorms occur at a frequency of about once every three years.[2]

b. Drainage and Flooding

There are no creeks or other natural water courses crossing the North Park Street Code area. Surface water occurs as sheetflow[3] that is collected in a stormwater drainage system. A discussion of stormwater is provided in **Chapter IV.D, Municipal Utilities**.

The City of Alameda has been evaluated for flooding hazards by the Federal Emergency Management Agency (FEMA). According to FEMA, the North Park Street Code area does not include any areas subject to regional flood hazards.

The North Park Street Code area is not located within identified dam failure inundation hazard areas.[4]

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1 Western Regional Climate Center, 1998. Website: www.wrcc.dri.edu/elimsmsfo.html.

2 Brown, William, M. III, 1988. Historical Setting of the Storm: Perspectives on Population, Development, and Damaging Rainstorms in the San Francisco Bay Region, in Landslides, Floods, and Marine Effects of the Storm of January 3-5, 1982, in the San Francisco Bay Region, California, Stephen D. Ellen and Gerald F. Wieczorek, Eds., U.S. Geological Survey Professional Paper 1434.

3 Sheetflow occurs when runoff moves as a continuous smooth sheet across the whole slope (i.e., drainage is not channelized).

4 Ibid.

c. Coastal Hazards

The location of the North Park Street Code area (adjacent to the Oakland Estuary) may result in the site being affected by coastal hazards, such as tsunamis, extreme high tides, or sea level rise.

(1) Tsunamis

A tsunami is a sea wave produced by an offshore earthquake, volcanic eruption, or landslide.[5] Tsunamis are difficult to observe in the open ocean because they have relatively low wave heights (typically less than 10 feet) and travel very fast (up to 500 miles per hour).[6] Tsunamis can be exceedingly destructive upon reaching exposed coastlines, where they are capable of rising to 100 feet in height and moving at 30 miles per hour. The San Francisco Bay, and its tidally influenced tributaries, are partially protected from inundation and damage associated with tsunamis because of the restricted hydraulic access at the Golden Gate. The predicted wave run up in the Oakland Estuary adjacent to the North Park Street Code area has been estimated to be 5.0 feet above mean sea level for the 100-year tsunami.[7]

(2) Extreme High Tides and Sea Level Rise

Extreme high tides in the San Francisco Bay result from the combined effects of astronomical high tides (related to the lunar cycle) and other factors including winds, barometric pressure, ocean temperatures, and freshwater runoff.[8] In California, the highest astronomical tides occur in the summer and winter, and, therefore, extreme high tides occur during these times. The highest tide ever recorded in the San Francisco Bay (between 1855 and 1983) occurred on December 3, 1983 (tide elevation of 6.0 feet above National Geodetic Vertical Datum (NGVD). Based on the 129-year record of daily high tide, the U.S. Army Corps of Engineers (Corps) has developed an estimated 100-year high tide elevation for various locations within the Bay. The elevation of the adopted 100-year tide at the North Park Street Code area is approximately 6.5 feet above NGVD.[9] The Corps indicates that northern Alameda County (including the North Park Street Code area) lacks significant tidal flooding problems (although fluvial flooding exacerbated by high tides could occur) to warrant further evaluation of tidal flood control projects.[10]

Tidal gauge measurements collected over the last 100 years indicate that sea level is rising relative to the land surface in many locations throughout the world.[11] Over the last 100 years, the temperature

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5 Steinbrugge, K., 1982. Earthquakes, Volcanoes, and Tsunamis: An Anatomy of Hazards. Skandia America Group.

6 Costa, J. and V. Baker, 1981. *Surficial Geology, Building with the Earth*, John Wiley and Sons, pp. 435-440.

7 Houston, J.R., and A.W. Garcia, 1975. Type 16 Flood Insurance Study: Tsunami Predictions for Monterey and San Francisco Bays and Puget Sound, Technical Report H-75-17. November.

8 US Army Corps of Engineers, 1989. San Mateo and Northern Alameda Counties Interim San Francisco Bay Shoreline Study. September.

9 US Army Corps of Engineers, 1984. San Francisco Bay, Tidal Stage vs. Frequency Study. October.

10 US Army Corps of Engineers, 1989. San Mateo and Northern Alameda Counties Interim San Francisco Bay Shoreline Study. September.

11 Bay Conservation and Development Commission (BCDC), 1987. Sea Level Rise: Predictions and Implications for San

of the earth's surface has risen approximately 0.6 degrees Celsius.[12] It is widely believed that sea levels will continue to rise in response to global warming. Global warming causes thermal expansion of the upper layers of the ocean (increasing the volume of water) and melting of the earth's glaciers and polar ice fields. Such increases in sea level, if sustained over long periods of time, could create flooding problems (or exacerbate existing problems) for those areas currently protected from flooding with only minimal freeboard. To plan for, and mitigate, potential flooding problems associated with sea level rise, it is important to be able to quantify the amount of sea level rise expected at a specific location over a given time period. Long-range projections of the behavior of physical systems are extremely difficult because of the uncertainties involved.

Global climate change will likely result in sea level rise and could expose shoreline areas to flooding as well as affect the timing and amount of precipitation. Climate change is expected to result in more extreme weather events; both heavier precipitation events that can lead to flooding as well as more extended drought periods. According to a report by the Intergovernmental Panel on Climate Change, the average global mean sea level increased by approximately 5.9 inches during the past 100 years (IPCC, 2007). The IPCC report (2007) projects global mean sea level could increase by 7 to 23 inches by 2099. Estimates of sea level rise vary between model runs and researchers, so trends and potential increases are typically reported in ranges. Another reported range of possible sea level rise increases by 2100 have been estimated at 40.2 inches (1.02 m) to 57.5 inches (1.46 m) (Pacific Institute, 2009).

Those portions of the North Park Street Code area below the elevation of extreme high tide (approximately 6.5 feet above NGVD), when considered in light of the incremental increase in predicted sea level, and not protected by levees or other similar features, could be subject to increased flooding hazards as time progresses. It should be noted that these areas may not be susceptible to flooding if they are protected by continuous natural high areas or constructed berms.

d. Water Quality

The quality of surface and groundwater at the North Park Street Code area is affected by historic and current land uses in the area and by the composition of subsurface geologic materials. Water quality in surface and groundwater bodies is regulated by the State Water Resources Control Board and Regional Water Quality Control Boards. The North Park Street Code area is under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board (RWQCB), which is responsible for implementation of State and Federal water quality protection guidelines in the vicinity of the North Park Street Code area. The RWQCB implements the Water Quality Control Plan (Basin Plan),[13] a master policy document for managing water quality issues in the region. The Basin Plan establishes beneficial uses for waterways and water bodies within the region. Beneficial uses of coastal waters in the San Francisco Bay include water contact recreation, non-contact water recreation, industrial service supply, navigation, marine habitat, shellfish harvesting, fishing, and preservation of rare and endangered species. Beneficial uses of East Bay Plain groundwater aquifer (the aquifer underlying

Francisco Bay. December.

12 US Environmental Protection Agency (USEPA), 1995. The Probability of Sea Level Rise, EPA 230-R-95-008. October.

13 Regional Water Quality Control Board, San Francisco Bay Region, 1995. *Water Quality Control Plan*. June 21.

the North Park Street Code area represents a small portion of this larger aquifer) include municipal and domestic water supply, industrial process water supply, and agricultural water supply.

(1) Surface Water

Runoff water quality is regulated by the Federal National Pollution Discharge Elimination System (NPDES) Non-point Source Program (established through the Clean Water Act). The objective of this program is to control and reduce pollutant discharges to water bodies from non-point sources. The program is administered by the California Regional Water Quality Control Boards. The North Park Street Code area would be under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board and the City of Alameda. The City is a participant in the Alameda County-wide Clean Water Program.

Projects disturbing more than 1 acre of land during construction are required to file a Notice of Intent (NOI) with the RWQCB to be covered under the State NPDES General Construction Permit, prior to the start of construction, for discharges of storm water associated with construction activity. A developer must propose control measures that are consistent with the State General Permit. The General Construction Permit requires the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) for each site covered by the general permit. The SWPPP must be prepared before construction begins, usually during the planning and design phases of a project. The plan must include specifications for Best Management Practices (BMPs) designed to reduce potential impacts to surface water quality through the construction period and the subsequent life of the project. Staff training for all contractors and subcontractors is required, as is water quality monitoring during the construction period. Implementation of the SWPPP starts with the commencement of construction and continues through project completion.

To reduce the long-term effects of runoff, the RWQCB is requiring runoff control to be built-in to development projects. Project developers will be required to submit a Stormwater Control Plan with their application for planning and zoning approval. This plan (in addition to the SWPPP, which will still be required), must show how the proposed development will comply with each aspect of the new "C.3" regulations (i.e., show how drainage from each impervious area on the site is captured and directed to a treatment device). Developers must also describe how these devices will be operated and maintained in perpetuity.

The Oakland Estuary is the receiving water body for runoff for the North Park Street Code area. Under the Bay Protection and Toxic Cleanup Program,[14] portions of the Estuary[15] have been designated "candidate toxic hot spots" based on water and/or sediment samples "that exhibit

[14] The California State Water Resources Control Board (SWRCB) has contracted with the California Department of Fish and Game (CDFG) to coordinate the scientific aspects of the Bay Protection and Toxic Cleanup Program (BPTCP), a SWRCB program mandated by the California Legislature. The BPTCP is a comprehensive, long-term effort to regulate toxic pollutants in California's enclosed bays and estuaries.

[15] The specific portions of the Estuary that have been designated candidate toxic hot spots are areas near storm drain outfalls at the Pacific Drydock and Fruitvale Avenue (southeast of the North Park Street Code area).

toxicity associated with some pollutants."[16] The identified contaminants of concern within the Estuary include silver, cadmium, chromium, copper, mercury, lead, DDT, polynuclear aromatic hydrocarbons, PCBs, chlordane, and dieldrin.

(2) Groundwater

Prior to human development, the quality of shallow groundwater at Alameda Island was excellent.[17] Groundwater was recharged only by rainfall; no other sources contributed to the shallow aquifer. Historic accounts of water obtained from wells drilled in the Merritt Sand on Alameda Island in the mid- to late-1800s describe the water as the "sweetest" in the area. Overpumping of these wells resulted in salt water intrusion and closure of most of the wells by the turn of the century. Only minor pumping of groundwater from the aquifer underlying Alameda Island has occurred since 1900.[18]

Shallow groundwater occurs in the North Park Street Code area. The geotechnical study completed for the Marina Cove subdivision states that groundwater is present at depths ranging from 2 to 5 feet below the ground surface (bgs).[19]

(3) Dredging

Dredging in the Bay and disposal of dredge spoils is a highly regulated activity. Prior to initiation of any dredging activities, a project proponent proposing dredging would be required to submit an application to the Dredged Material Management Office (DMMO), a joint program of BCDC, San Francisco Bay Regional Water Quality Control Board (RWQCB), State Lands Commission (SLC), the San Francisco District U.S. Army Corps of Engineers (COE), and the U.S. Environmental Protection Agency (EPA). Also participating is the California Department of Fish and Game, which provides advice and expertise to the process. The purpose of the DMMO is to cooperatively review sediment quality sampling plans, analyze the results of sediment quality sampling and make suitability determinations for material proposed for disposal in San Francisco Bay. The goal of this interagency group is to increase efficiency and coordination between the member agencies and to foster a comprehensive and consolidated approach to handling dredged material management issues. Applicants using DMMO fill out one application form, which the agencies then jointly review at bi-weekly meetings before issuing their respective authorizations.

BCDC, the COE, the EPA, and the RWQCB developed a Long Term Management Strategy (LTMS) program to guide dredging and disposal of materials from San Francisco Bay in an economic and environmentally sensitive manner. Within the LTMS program, the EPA studied acceptable ocean

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16 California, State of, Water Resources Control Board, 1993. *Status of the Bay Protection and Toxic Cleanup Program, Staff Report.* November.

17 Figuers, S., 1998. *Groundwater Study and Water Supply History of the East Bay Plain, Alameda and Contra Costa Counties, California.* Prepared for the Friends of the San Francisco Estuary. June 15.

18 *Ibid.*

19 Lowney Associates, 1998. Geotechnical Investigation, Weyerhaeuser/Chipman Parcels, Alameda, California. December 11.

disposal sites, the RWQCB reviewed disposal of dredged materials in the Bay, and BCDC evaluated the potential for using dredged materials in upland disposal. The COE oversees the overall management of the LTMS program. A comprehensive management plan has been prepared based on the results of these studies. Potential reuse alternatives include fill for construction, levee maintenance, landfill cover, and marsh restoration.

2. IMPACTS AND MITIGATION MEASURES

This section begins with a description of the criteria utilized to determine whether any significant water resource impacts would result, followed by a discussion of potential impacts. The impact discussion is organized into less-than-significant impacts and significant impacts.

a. Significance Criteria

A significant impact would result from development that may occur as part of buildout of the North Park Street Code if it would:

- Violate any water quality standards or waste discharge requirements;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
- Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff;
- Otherwise substantially degrade water quality;
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows;
- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam; or
- Expose people or structures to a significant risk of inundation by seiche, tsunami, or mudflow.

b. Beneficial and Less-than-Significant Impacts

Buildout of the North Park Street Code area may result in a slight reduction in the amount of impervious surface area that currently exists within most areas of the North Park Street Code area, due to the conversion of some of the paved areas at the industrial sites to landscaped areas and open space.. A reduction in impervious cover would be expected to reduce the rate and volume of stormwater runoff while increasing infiltration and groundwater recharge (most new development would take place in areas that are already covered with impervious surface). As a result, buildout of the North Park Street Code area may result in a beneficial impact on water quality.

Less-than-significant impacts that would result under buildout of the North Park Street Code area are discussed below. Potential impacts that do not exceed the significance criteria listed above are discussed first.

(1) Water Quality or Discharge Standards

The uses proposed as part of the North Park Street Code would not result in any industrial-type discharges that would lead to the imposition of specific waste discharge requirements (which, when required, are set by the RWQCB), and, therefore, would not be expected to exceed waste discharge standards for point sources. Development under the North Park Street Code would be subject to the RWQCB requirements of non-point-source regulations. Potential construction period impacts are discussed under **Impact HYD-1**, below.

(2) Groundwater

The North Park Street Code would not result in any significant adverse effects related to the groundwater supply. No extraction from groundwater or injection into groundwater is proposed, and development under the North Park Street Code would not have any significant effect on deep aquifers.

Construction of specific types of buildings or utilities may require excavation below the groundwater level, which may require pumping of groundwater to dewater excavations. Groundwater within the North Park Street Code area is generally quite shallow, ranging in depth from approximately 2 to 6 feet below the surface. As mentioned in **Section IV.L, Hazardous Materials**, existing groundwater quality data indicate that the shallow groundwater in some areas contains contaminants, which if improperly handled and discharged, could result in significant impacts to the health and safety of the public or site workers that may come into contact with dewatering effluent.

Depending on the level of contamination (if any), the dewatering effluent may be acceptable for discharge to the storm drainage system or the municipal sanitary sewer system. Either discharge would require proper permitting from the regulating agencies; the RWQCB for discharges to the storm drain system or surface waters and/or EBMUD for discharges to the sanitary sewer. These

permitting programs are existing programs that would be expected to adequately mitigate potential impacts to water quality to a less- than-significant level.

(3) Water Movements and Flood Waters

The North Park Street Code area is relatively flat and, although the drainage patterns may be altered by the installation of storm drainage infrastructure, no significant changes to the currents or course of water movements, or alteration of course or flow of floodwaters, would occur.

(4) Water-Related Hazards

The North Park Street Code area does not include any areas subject to regional flood hazards, according to FEMA. The area is relatively flat and would not be expected to be affected by mudflows or other types of landslides. A damaging seiche or tsunami in the Bay is a low probability event even for unprotected sites on the Bay. The North Park Street Code area is partially protected from seiches by the constriction at the mouth of the Oakland Estuary, and, therefore, inundation from seiches would represent a less-than-significant impact.

c. Significant Impacts

Potentially significant impacts related to water quality as discussed below. Potential impacts associated with stormwater runoff are described in **Section IV.D, Municipal Utilities**.

Impact HYD-1: Construction activities and post-construction site uses within the North Park Street Code area could result in degradation of water quality in the Oakland Estuary and the San Francisco Bay by reducing the quality of storm water runoff.

Construction and grading within the North Park Street Code area would involve temporary disturbance of surface soils, and removal of existing cover. During the construction period, grading and excavation activities would result in exposure of soil to runoff, potentially causing erosion and entrainment of sediment in the runoff. Soil stockpiles and excavated parcels would be exposed to runoff and, if not managed properly, the runoff could cause erosion and increased sedimentation in the Oakland Estuary. The accumulation of sediment could result in blockage of flows, potentially resulting in increased localized ponding or flooding.

The potential for chemical releases is present at most construction sites. Once released, substances such as fuels, oils, paints, and solvents could be transported to the Oakland Estuary and/or groundwater in storm water runoff, wash water, and dust control water, potentially degrading the quality of the receiving waters.

New construction and intensified land uses in the North Park Street Code area would result in increased vehicle use and potential discharge of associated pollutants. Leaks of fuel or lubricants, tire wear, and fallout from exhaust contribute petroleum hydrocarbons, heavy metals, and sediment to the pollutant load in runoff being transported to receiving waters. Runoff from the proposed

common landscaped areas, individual home sites, and other uses may contain residual pesticides and nutrients. Central parking areas would contribute primarily vehicle related contaminants listed above. Long term degradation of water quality runoff from the site could impact water quality in the Oakland Estuary and San Francisco Bay.

The following mitigation measure would serve to address both construction and operation period water quality effects.

> **Mitigation Measure HYD-1:** All specific development projects approved pursuant to the North Park Street Code, and that involves site clearing, grading or excavation as part of the proposed construction activity and that result in soil disturbances of 1 or more acres, (and for projects of less than 1 acre if the construction activity is part of a larger common plan of development), shall be required to prepare a Stormwater Pollution Prevention Plan (SWPPP). To avoid unnecessary duplication of effort, the SWPPP prepared for the first site or development project within the North Park Street Code area may be used as the basis for a SWPPP required for subsequent projects, provided that each version of the SWPPP is modified as necessary to maintain compliance with the qualitative standards set forth in this EIR and with applicable regulations and standards of the RWQCB.
>
> Each SWPPP shall be designed to reduce potential impacts to surface water quality through the construction and life of the Project for which it is prepared. Each SWPPP shall conform to the requirements of the Alameda County Clean Water Program which set new standards effective February 2003, and to the standards set forth herein. Each SWPPP would act as the overall program document designed to provide measures to mitigate potential water quality impacts associated with implementation each proposed project. Preparers of each SWPPP should review the Conditions of Approval (including General Conditions for Construction, Residential Development/Construction Conditions, and Commercial/Industrial Conditions) established by the City.
>
> Each SWPPP shall include the following three elements to address construction, post-construction and pest management issues:
>
> - ***Specific and Detailed Best Management Practices (BMPs) Designed to Mitigate Construction-related Pollutants***. These controls shall include practices to minimize the contact of construction materials, equipment, and maintenance supplies (e.g., fuels, lubricants, paints, solvents, adhesives) with storm water. The SWPPP shall specify properly designed centralized storage areas that keep these materials out of the rain. The contractor(s) shall submit details, design and procedures for compliance with storage area requirements.
>
>   An important component of the storm water quality protection effort is knowledge on the part of on-site construction and maintenance supervisors and workers. To educate on-site personnel and maintain awareness of the importance of storm water quality protection, site supervisors shall conduct regular meetings to discuss pollution

prevention. The SWPPP shall establish a frequency for meetings and require all personnel to attend.

The SWPPP shall specify a monitoring program to be implemented by the construction site supervisor, and must include both dry and wet weather inspections. City of Alameda personnel shall conduct regular inspections to ensure compliance with the SWPPP.

BMPs designed to reduce erosion of exposed soil may include, but are not limited to: soil stabilization controls, watering for dust control, perimeter silt fences, placement of hay bales and sediment basins. If grading must be conducted during the rainy season, the primary BMPs selected shall focus on erosion control (i.e., keeping sediment on the site). End of pipe sediment control measures (e.g., basins and traps) shall be used only as secondary measures. If hydroseeding is selected as the primary soil stabilization method, these areas shall be seeded by September 1 and irrigated to ensure that adequate root development has occurred prior to October 1. Entry and egress from the construction site shall be carefully controlled to minimize off-site tracking of sediment. Vehicle and equipment wash-down facilities shall be designed to be accessible and functional both during dry and wet conditions.

- ***Measures Designed to Mitigate Post-construction-Related Pollutants.*** The SWPPP shall include measures designed to mitigate potential water quality degradation of runoff from all portions of the completed development. It is important that post construction storm water quality controls are required in the initial design phase of redevelopment projects and not simply added after the site layout and building footprints have been established. The specific BMPs that would be required of a project can be found in *SF Bay Regional Water Quality Control Board Staff Recommendations for New and Redevelopment Controls for Storm Water Programs*. In addition, the design team should include design principles contained in the Bay Area Stormwater Management Agencies Association's manual, *Start at the Source, Design Guidance Manual for Stormwater Quality Protection.* The selection of BMPs required for a specific project is based on the size of the development and the sensitivity of the area. The Estuary is considered a sensitive area by the RWQCB. In general, passive, low maintenance BMPs (e.g., grassy swales, porous pavements) are preferred. If the SWPPP includes higher maintenance BMPs (e.g., sedimentation basins, fossil filters), then funding for long term maintenance needs must be specified in the SWPPP as a condition of approval of the grading, excavation, or building permits, as appropriate (the City will not assume maintenance responsibilities for these features).

- ***Integrated Pest Management Plan***. An Integrated Pest Management Plan (IPM) shall be prepared and implemented by the Project for all common landscaped areas. Each IPM shall be prepared by a qualified professional. The IPMs shall address and recommend methods of pest prevention and turf grass management that use pesticides as a last resort in pest control. Types and rates of fertilizer and pesticide application

shall be specified. Special attention in the IPMs shall be directed toward avoiding runoff of pesticides and nitrates into sensitive drainages or leaching into the shallow groundwater table. Pesticides shall be used only in response to a persistent pest problem. Preventative chemical use shall not be employed. Cultural and biological approaches to pest control shall be fully integrated into the IPMs, with an emphasis toward reducing pesticide application.

The City of Alameda Department of Public Works shall review and approve each SWPPP prior to the approval of the Development Plan for each project phase to ensure that the selected BMPs would adequately protect water quality. The City and the RWQCB are empowered to levy considerable fines for non-compliance with the SWPPP. Compliance with the approved SWPPP would mitigate the impact to a **less-than-significant** level.

Impact HYD-2: Dredging that may be undertaken to develop a marina or be associated with maintenance of existing marinas, or reconstruction of bulkheads and infrastructure in the North Park Street Code area may cause impacts to water quality at the dredging and disposal sites.

During dredging, sediments would be disturbed, producing a short term increase in turbidity. Increased turbidity could affect dissolved oxygen levels by decreasing light penetration into the water and decreasing oxygen generating photosynthesis. Alteration of dissolved oxygen levels could affect aquatic life in the water body. In addition, increased turbidity caused by dredging could mobilize pollutant containing sediments, potentially causing short term increases in pollutants in the water column. Appropriate dredging methods such as clamshell dredging would minimize turbidity and are feasible to use.

The three disposal options for dredged sediments identified in the Long Term Management Strategy (LTMS) include: 1) in-Bay disposal; 2) ocean disposal; and 3) upland/wetland reuse. Disposal of dredge spoils in the Bay or ocean may create water quality impacts with sediment plumes from the initial disposal event (and with the subsequent resuspension of material from the dispersive in-Bay sites).[20] Upland reuse could result in erosion and sedimentation problems and discharge of pollutants to the land and surface waters.

The LTMS, which is currently in effect, establishes a regional program that allows the regulating agencies to manage the disposal of dredge spoils using each of the three available disposal options in a way that decreases the overall environmental impacts associated with all dredging activities in the San Francisco Bay region, thereby minimizing potential cumulative impacts. The DMMO and the provisions of the LTMS provide guidance for individual dredging projects which stipulate the

[20] U.S. Environmental Protection Agency, Regional Water Quality Control Board, and Bay Conservation and Development Commission, 1998. *Long-Term Management Strategy (LTMS) for the Placement of Dredged Material in the San Francisco Bay Region.* October.

sediment testing criteria, periods of time dredging is allowable in particular areas to decrease potential impacts to habitat, and disposal options.

> **Mitigation Measure HYD-2:** All dredging and in-water construction activities shall be consistent with the standards and procedures set forth in the Long Term Management Strategy, a program developed by the Bay Conservation and Development Commission (BCDC), the Regional Water Quality Control Board (RWQCB), the U.S. Environmental Protection Agency (EPA), and other agencies, to guide dredging and the disposal of dredge materials in an environmentally sound manner.

Impact HYD-3: Site development under the proposed project could be subjected to flooding as a result of sea level rise. (Less than Significant)

Quantifying potential sea level rise into the future is difficult to predict but it has been estimated as high as 57 inches by the year 2100. The proposed project includes improvements on a narrow strip ofland along the Estuary that is currently owned by the U.S. Army Corps of Engineers. This land is anticipated to be transferred to the City of Alameda, possibly as early as 2011, as part of a larger plan by the Corps to relinquish its ownership of the entire Tidal Estuary. Any improvements on land owned by the Corps or the City of Alameda would be undertaken by the project applicant, subject to the approval of the applicable property owner (Corps or City), in addition to regulatory approval by entities including, but not limited to, the Corps, the Regional Water Quality Control Board, the Bay Conservation and Development Commission, and the City of Alameda. Shoreline improvements would likely include the construction of a sea wall, which would be constructed according to current standards and BCDC guidelines which address the latest data on sea level rise.

> **Mitigation Measure HYD-3**: The project applicant shall design and construct the proposed seawall such that future adaptive management measures can be implemented to further protect upland areas from potential rising sea levels. Prior to construction, the [mal seawall design shall be reviewed by BCDC and in accordance with current guidelines regarding protection against sea level rise.

Significance after Mitigation: Less than Significant

Cumulative Impacts

Hydrology and Water Quality

Impact HYD-4: Increased construction activity and new development resulting from the proposed project, in conjunction with other reasonably foreseeable development in Alameda, would not result in cumulative impacts with respect to hydrology and water quality. (Less than Significant)

Implementation of the project, together with past present and other reasonably foreseeable future projects in the vicinity, would not result in adverse cumulative effects to hydrology and water quality. These effects could include increases in stormwater runoff and pollutant loading to the tidal canal and San Francisco Bay. The project and other future projects in the vicinity would be required to comply

with drainage and grading ordinances intended to control runoff and regulate water quality at each development site. Additionally, new projects would be required to demonstrate that stormwater volumes could be managed by downstream conveyance facilities. New development projects in Alameda and Oakland also would be required to comply with Alameda County and City of Oakland ordinances regarding water quality, and ACCWP NPDES permitting requirements. All construction work and dredging activities within the Tidal Canal would require permits from the Corps and RWQCB which require all activities to be conducted in a fashion that minimizes adverse effects to water quality. Therefore, the effect of the project on water quality and hydrology, in combination with other cumulative projects, would not be significant. Additionally, the project itself would reduce impervious surfaces in the project, thereby decreasing runoff
from the site.

Mitigation: None required